

CAUSAL FACTORS

- **SUPPLY SHORTAGE WITH RESPECT TO DEMAND**
- **TRANSMISSION BOTTLENECKS**
- **NATURAL FACTORS**
- **DEFECTS IN “DEREGULATION”**
- **IMPERFECT MARKET**
- **FINANCIAL CONCERNS**

SUPPLY SHORTAGE WITH RESPECT TO DEMAND

- **Gross underestimation of electricity demand (25% growth rate in 1990s)**
- **Serious slackening of conservation efforts**
- **Polluting plants were idled**
- **Old power plants (55% of plants > 30 years old) operated less efficiently.**

SUPPLY SHORTAGE WITH RESPECT TO DEMAND

- Generators shut down because of untimely unscheduled power plant maintenance
- no new major power plants had been built in California in the 1990s. (NIMBY attitude)
- increased demand in states exporting power to California.

TRANSMISSION BOTTLENECKS

- Trading in power --> greater distances between generators and consumers
- Hence, transmission grid is overtaxed
- Little incentive to invest on a transmission grid accessible to all generators

NATURAL FACTORS

- Storms led to the shut down of the 2,200 MW Diablo Canyon nuclear plant
- Late runoff on the rivers of the Pacific Northwest reduced hydroelectric generation.

DEFECTS IN “DEREGULATION”

- Divestiture w/o ensuring that new owners would sell electricity at a reasonable price for a long number of years.
- Failure to anticipate that energy supply companies could hold back electricity and selling it when the system was desperate for electricity

DEFECTS IN “DEREGULATION”

- Inadequate regulation of wholesalers
- “Deregulation” did not prompt more competition right away.
- “Deregulation” resulted in disincentives for new capacity & for improvement/ expansion of transmission and for R&D relevant to transmission.

IMPERFECT MARKET

- FERC commissioners called the California market "seriously flawed" (November 1, 2000)
- Clear evidence of market power based on rising gas prices, higher loads and supply disruptions.
- Cal-ISO also became an easy way of bypassing the market

FINANCIAL CONCERNS

- Debts of utilities accumulated to staggering proportions (\$13 billion)
- Credit rating agencies started rating California utilities as junk bonds less than investment grade.
- Approaching bankruptcy, utilities could not purchase electricity for distribution.

LESSON 1: DON'T ASSUME A MARKET-DRIVEN SYSTEM WILL BE *IPSO FACTO* MORE SUCCESSFUL

- A market-driven system is associated with transaction costs and gestation times.
- Careful comparison of the costs and benefits of the old regulated system and the new deregulated system is essential before dismantling the old and ushering in the new.

LESSON 2: A MARKET ALONE IS NOT SUFFICIENT

- When a cost-plus price regime is replaced with market-driven prices, it must be demonstrated that the market does not permit the exercise of market power, price gouging and gaming.
- The extent of competition must be monitored.

LESSON 3: UNBUNDLING MUST ALSO BE JUSTIFIED ON TECHNICAL GROUNDS

- Apart from economists and bureaucrats, power system engineers must also be involved.
- A technically stable and institutionally sustainable integrated operation of supply-demand matching must be ensured *before* unbundling is implemented
- The quantitative indicators of the success of supply-demand matching are
 - (1) the frequency of the system,
 - (2) the voltage supplied to consumers
 - (3) the continuity of the supply.

**LESSON 4: AN UNBUNDLED SYSTEM
MAY HAVE NO INCENTIVE TO MAINTAIN
SAFE RESERVE MARGINS OF 15-20%**

- When reserves fall below to precarious levels, there is greater possibility of profitable price increases
- The technical and institutional measures to ensure safe reserve margins are extremely important.

**LESSON 5: AFFORDABILITY OF ELECTRICITY
PRICES TO CONSUMERS IS A NECESSARY
CONDITION FOR THE SUCCESS OF
RESTRUCTURING**

- Hence, the impact of restructuring on prices must be anticipated before rushing into restructuring particularly unbundling and privatisation.
- In case of doubt, it is advisable to test the assumptions underlying restructuring in experimental areas.

LESSON 6: A STRONG ROLE FOR THE STATE AND FOR REGULATION IS ESSENTIAL

- The market alone cannot take care of the integrated functioning of the electricity system
- The requisite regulatory arrangements must be in place.
- It is important to have mechanisms in place to ensure that there are adequate reserve margins to cope with sudden peaks of demand and shortfalls of supply.
- In case the process derails, there must be emergency procedures for the state to come to the rescue.

LESSON 7: THE ELECTRICITY SYSTEM IS RADICALLY DIFFERENT UNDER CONDITIONS OF SUPPLY SHORTAGES

- The behaviour of the actors is radically different under conditions of supply shortages compared to that under conditions of surpluses.
- The experience of restructuring has come by and large from countries and systems with surplus capacity.
- Deregulation under conditions of shortage is not the proven success that is being touted
- It is very much an unproven experiment with California yielding the first results.

: Compared to increasing capacity by building new power plants, energy conservation measures provide the quickest way out of the crisis.

It is unwise to go ahead with restructuring/reform without specifying the criteria by which the success/failure of the restructuring/reform process will be judged.

: Notwithstanding all the hype about the economic efficiency of globalisation, there are major advantages of state electricity systems being self-reliant in the sense of not allowing control to be assumed by forces external to the state. This means that dependence on external power must be a strategy of the last resort.

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